World Health Organization

REGIONAL OFFICE FOR Europe

# WHO Meeting: Taking stock of influenza surveillance in the newly independent states

# SUMMARY REPORT

**Istanbul, Turkey, 16-17 November 2011**

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## Executive summary

Sentinel surveillance is considered the most efficient system for routine monitoring of influenza, as it provides timely and high-quality data from a limited number of sites. Since 2008, the World Health Organization Regional Office for Europe (WHO/Europe) and the Centers for Disease Control and Prevention (CDC), Atlanta, United States, have collaborated with Member States of the WHO European Region to strengthen sentinel surveillance for influenza. The newly independent states (NIS) have been a particular focus in this regard.

In order to review progress in the implementation of sentinel influenza surveillance, a meeting was organized with key experts from the Ministries of Health and national influenza focal points from all NIS[1]. Opportunities and challenges for moving from a universal surveillance of influenza and other respiratory diseases to a sentinel system were also discussed.

## Summary of findings

This meeting underlined the major achievements towards strengthening of influenza surveillance that have taken place in NIS in recent years. Since 2007, sentinel outpatient surveillance for influenza like illness (ILI) has been introduced in 9 of 12 countries represented at the workshop, signifying a shift in traditional outpatient surveillance for influenza in the NIS. In addition to ILI surveillance, hospital-based surveillance for severe acute respiratory infections (SARI) has also been widely adopted in this region. Nevertheless, the level of implementation varies across NIS, with some countries establishing sentinel surveillance only very recently.

There was general consensus among participants that sentinel ILI surveillance had filled an important gap in influenza monitoring in NIS, primarily because the system has facilitated better integration of virological and epidemiological data, as well as a more systematic approach to testing of respiratory samples for influenza. It was also acknowledged that the systematic collection and testing of respiratory samples from a small number of sentinel sites had the potential to provide similar or higher quality information compared to testing a large number of respiratory samples within a universal surveillance system.

In most countries, however, sentinel ILI surveillance has been implemented as an addition to universal outpatient surveillance for acute respiratory infection (ARI), which is notifiable throughout NIS. This has increased the workload for clinicians at sentinel sites for a number of reasons:

i) ILI is reported using a separate reporting system (and forms) from other notifiable diseases.

ii) There is a continued requirement to report respiratory diseases (ARI) according to ICD-10[2] in addition to ILI.

iii) The ILI case definition is not, in contrast to ARI, used for clinical diagnosis of respiratory disease, which is required for reimbursement by the health insurance in some countries, and therefore, in

[1] Armenia, Azerbaijan, Georgia, Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Ukraine, Tajikistan, Turkmenistan, and Uzbekistan.
[2] International Classification of Diseases, 10th revision.

order to fulfil this requirement, clinicians are obliged to record patients with respiratory illness twice.

Furthermore, recent evaluations of some sentinel systems have indicated that the differences between the ILI case definition and existing definitions for ARI and suspected influenza are poorly understood at some sentinel sites.

The meeting concluded that it was premature to determine if sentinel surveillance systems for influenza and other respiratory diseases could replace universal reporting in NIS, as has happened in other Member States of the WHO European Region during the past decades. Without specific systems for monitoring unusual events (including outbreaks of respiratory diseases), universal ARI surveillance will continue to play a role for early warning of respiratory diseases in NIS.

## Key recommendations

Participants agreed on a number of key activities to be implemented in the short and medium term:

- identify the roles and objectives of universal ARI and sentinel ILI systems in the surveillance of influenza and other respiratory pathogens in order to better understand if and how these systems complement each other;
- evaluate the feasibility of performing influenza testing only as part of the sentinel surveillance to use resources most efficiently;
- evaluate the performance of national influenza monitoring systems, including outpatient surveillance for ILI and ARI and hospital-based surveillance for SARI, and early warning systems in order to optimize surveillance and use of resources; and
- conduct refresher training for staff at sentinel ILI and SARI sites to improve quality of data and respiratory sample collection.

## Background

Since 2008, the World Health Organization Regional Office for Europe (WHO/Europe) and the Centers for Disease Control and Prevention (CDC), Atlanta, United States of America have collaborated with Member States of the WHO European Region to strengthen surveillance for influenza.

Implementation of sentinel outpatient surveillance for influenza like illness (ILI) and hospital-based surveillance for severe acute respiratory infections (SARI) is central to WHO/Europe's strategy for strengthening influenza surveillance in the Region. Recommendations for standardized approaches for inpatient and outpatient respiratory disease surveillance, data collection, analysis and reporting have recently been published[3].

On 16-17 November 2011, WHO/Europe held a workshop in Istanbul, Turkey for influenza experts from the newly independent states[4] (NIS). The aim of the workshop was to bring together epidemiologists involved in influenza surveillance and representatives from Ministries of Health responsible for surveillance of communicable diseases in order to review progress in implementation of sentinel surveillance and to discuss technical and operational issues related to influenza surveillance.

Specific objectives of the meeting were to:

1. review current national influenza surveillance systems and public health measures for influenza prevention and control based on surveillance data;
2. review and discuss strengths and limitations of sentinel and universal surveillance for influenza;
3. discuss opportunities and challenges for moving from universal surveillance of respiratory diseases to a sentinel system, including integration of influenza surveillance within other national surveillance systems; and
4. discuss principles and objectives of influenza surveillance in outpatient clinics and hospitals and how current national influenza surveillance systems may meet these objectives.

This report reviews the main discussion points from the meeting, summarizes existing surveillance systems for influenza and public health measures for influenza in the newly independent states of the WHO European Region and provides recommendations for strengthening influenza surveillance in this region in the future.

[3] WHO Regional Office for Europe guidance for sentinel influenza surveillance in humans, 2011. Available in English and Russian www.euro.who.int/__data/assets/pdf_file/0020/90443/E92738.pdf

[4] Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan

# I. Surveillance systems for influenza

An overview of different surveillance systems for influenza was presented, including sentinel ILI, universal ARI, event-based (early warning) and enhanced influenza surveillance. Key features of each system (e.g. cost, sensitivity, specificity, flexibility, timeliness, completeness, quality) were also summarized, with a focus on routine sentinel and universal influenza surveillance systems.

Sentinel surveillance is the collection of data from a limited number of health facilities, selected to represent the population under surveillance. In contrast, universal surveillance collects data from all health care facilities. The principal advantages of sentinel surveillance in comparison with universal systems for influenza surveillance include: more effective use of resources; greater flexibility and timeliness; ability to collect standard information from individual cases; and higher data quality.

Sentinel surveillance is also considered the most suitable system for monitoring common diseases (such as influenza and other respiratory diseases) because it avoids overloading surveillance systems and physicians during epidemic periods. Also, the objectives of influenza surveillance may be more easily achieved in a system that focuses on a few number of surveillance sites. Main limitations of sentinel surveillance include low sensitivity to rare events (e.g. clusters of respiratory illness) and the fact that sentinel sites may not always be representative of populations outside of their catchment area.

Universal ARI surveillance, on the other hand, allows monitoring of a broader range of respiratory pathogens because the case definition is less specific and, because the system is universal, it may serve as an early warning system for unusual outbreaks of respiratory disease. However, these systems require substantial resources and do not usually provide more information on influenza than sentinel systems, assuming that these are representative and well-structured.

## Influenza surveillance in NIS

Participants from each country presented an overview of national influenza surveillance systems and public health measures implemented on the basis of data collected within those systems. The presentations were followed by a plenary discussion on the strengths and limitations of the different surveillance options for influenza and opportunities and challenges for moving from universal surveillance of respiratory diseases to sentinel surveillance.

### *Universal surveillance*

Universal surveillance for respiratory diseases, frequently referred to as ORVI[5] surveillance, has existed for decades in NIS. All health care facilities, including hospitals, are required to report cases of ORVI, which are further classified according to ICD-10 definitions for acute upper respiratory infections, including acute sinusitis, pharyngitis, tonsillitis, nasopharyngitis, epiglottitis, etc. In some countries, reporting of ORVI is case-based, while in other countries age-aggregated data are reported weekly or monthly to the central level by health care facilities. In addition, confirmed (and suspected) influenza, pneumonia and acute bronchiolitis are also notifiable in most NIS. The different diagnoses do not as such signify severity (i.e. pneumonia, bronchiolitis and pharyngitis cases, etc. may be reported from both outpatient clinics and hospitals). Respiratory samples are

[5] Acute Respiratory Viral Infection; equivalent to ARI (Acute Respiratory Infection)

generally collected at convenience, mostly from children, and tested for influenza and a selected number of other respiratory pathogens.

### *Sentinel surveillance*

Between 2007 and 2010, 9 of the 12 Member States represented at the meeting introduced sentinel surveillance for ILI according to the case definition proposed by WHO (2009)[6]. In all but one country, sentinel ILI surveillance has been implemented to complement traditional universal surveillance for ORVI. Furthermore, in the nine countries that introduced ILI surveillance, sentinel surveillance for SARI in hospitals has been established in the same period (Figure 1).

| Country | Universal ARI | Sentinel ILI | Sentinel SARI |
|---|---|---|---|
| **Armenia** | X | X | X |
| **Azerbaijan** | X | X | X |
| **Belarus** | X | X | X |
| **Georgia** | X | X | X |
| **Kazakhstan** | X | X | X |
| **Kyrgyzstan** | X | X | X |
| **Republic of Moldova** | X | X | X |
| **Russian Federation** | X | X | X |
| **Tajikistan** | X | | |
| **Turkmenistan** | X | | |
| **Uzbekistan**[1] | X | | |
| **Ukraine** | X | X | X |

[1] Planned implementation of sentinel ILI and SARI surveillance in 2011

**Figure 1: Current and planned surveillance systems for influenza in the newly independent states, as of November 2011**

Routine sampling of respiratory specimens for influenza testing during the influenza season takes place in all countries. Although a standard sampling procedure for selecting patients for respiratory specimen collection has been defined in most NIS, sentinel sites often do not follow the guidelines. Some countries also perform tests for other respiratory pathogens including respiratory syncytial virus, adenovirus, metapneumovirus and parainfluenza virus, although testing is generally limited.

### *Other surveillance systems for influenza*

In addition to clinical and virological surveillance for influenza, some countries are implementing surveillance of non-specific (indirect) indicators for influenza (e.g. school and work absenteeism rates, over-the-counter sales of cold or cough medicines, emergency admissions) with the aim to enhance the capacity of detecting unusual events and improving timeliness of detecting influenza epidemics.

[6] A person with sudden onset of fever >38°C AND cough or sore throat in the absence of other diagnosis. Please note that in 2011, the WHO recommended case definition for ILI was changed to: An acute respiratory illness with onset during the last 7 days with measured temperature ≥38°C AND cough (www.euro.who.int/__data/assets/pdf_file/0020/90443/E92738.pdf)

# II. Influenza surveillance data for public health action in NIS

In most countries, descriptive analysis of epidemiological and virological surveillance data is performed on a routine basis, but only some countries disseminate weekly influenza newsletters or other surveillance summaries regularly. Influenza surveillance data is most commonly used to announce the beginning of the season, inform anti-viral treatment in health care facilities, reinforce sanitary and epidemic control measures in hospitals (e.g. use of personal protective equipment, patient isolation, restriction of visits), support public awareness and mass-media campaigns, and develop policies on influenza including clinical guidelines and pandemic preparedness plans. School closures as a means to mitigate influenza outbreaks and epidemics are also frequently implemented in the NIS. However, while surveillance data is used to support school closures in the countries, in practice, decisions to close schools is taken by the individual institutions when absenteeism rates exceed a pre-determined threshold.

# III. Plenary discussion

## Strengths and limitations of different surveillance models for influenza

Meeting participants discussed the strengths and limitations of the different systems for influenza surveillance, as well as the rationale and challenges of implementing different systems in parallel.

Data from a number of countries with well established sentinel ILI surveillance support the notion that sentinel systems can provide an effective means of obtaining good quality data from a relatively low number of respiratory samples collected by selected health care providers – providing both information on the burden of disease and the start of the influenza season (Figure 2).

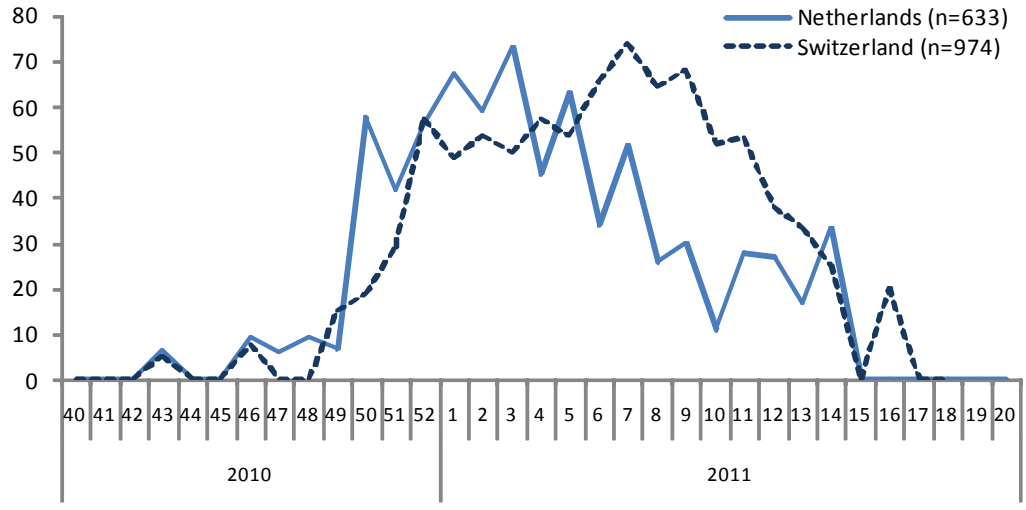


**Figure 2: Percent of sentinel ILI specimens positive for influenza by week during the 2010-2011 influenza season in the Netherlands, England, and Spain**

Similarly, in countries with both sentinel and universal surveillance, data indicate that testing of respiratory specimens from sentinel sites provides results comparable to universal surveillance in terms of timing and intensity of transmission, but with a substantially lower number of specimens (Figure 3).

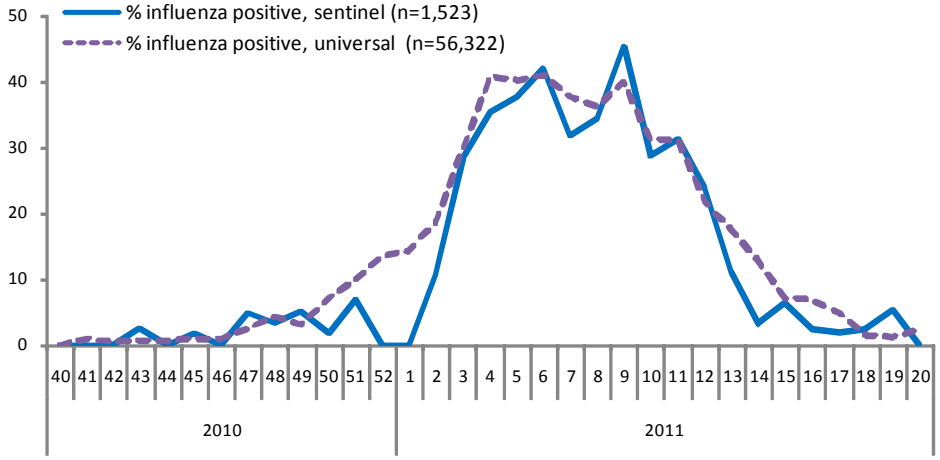


**Figure 3: Percent of sentinel and universal ARI specimens testing positive for influenza by week during the 2010-2011 influenza season in the Russian Federation. (A description of the sentinel surveillance system in the Russian Federation can be found at: www.euroflu.org/documents/Overview_of_SARI_Surveillance_Systems_13.02.2012.pdf )**

There was general consensus that the implementation of sentinel surveillance had filled an important gap in influenza monitoring in NIS, primarily because it had allowed a more efficient integration of virological and epidemiological data and consequently more informative data analysis. Moreover, prior to the introduction of sentinel ILI surveillance, testing of respiratory samples for influenza was limited in some countries and not performed systematically.

Nevertheless, many participants stressed that traditional (universal) ARI surveillance would continue to play a role in influenza surveillance in their countries and that sentinel ILI and universal ARI surveillance were considered complementary, not duplicating, systems.

Participants generally contended that maintaining both sentinel ILI and universal ARI surveillance was important for a number of reasons:

1) The ILI case definition is considered more specific for influenza than the ARI definition, and testing ILI patients for influenza is a more efficient use of resources.
2) Universal ARI surveillance is an important source for estimating the burden of respiratory infections, which remains a major cause of child morbidity and mortality in some countries of NIS.
3) ARI surveillance provides a mechanism for monitoring respiratory pathogens other than influenza.
4) The ILI case definition is currently not valid for health insurance reimbursement in many NIS because it is not recognized as a clinical diagnosis.
5) Sentinel systems collect information from selected sites only and are not suitable for detecting unusual outbreaks of respiratory disease. Universal ARI surveillance may therefore play an important role in early warning in countries where such systems are not well established.

Some participants, however, expressed concern that the implementation of two separate surveillance systems had substantially increased the burden for data providers at sentinel sites, as staff was required to collect and report both ARI and ILI data. This led to a discussion on how to optimize data reporting. It was proposed that countries that currently depend on paper-based reporting should explore the experiences from countries with nation-wide electronic reporting systems for infectious diseases and from countries that have implemented an influenza-specific electronic reporting system.

Moreover, it was noted that health care workers in clinics that participate in both sentinel ILI surveillance and universal ARI surveillance often did not appreciate the differences between the case definitions for ARI and ILI, and that the ILI case definition is intended for surveillance and not for diagnostic purposes. Hence, the group recommended more rigorous training of sentinel site clinicians and nurses in applying the case definitions, also to ensure that respiratory sample collection from patients meeting the ILI case definition was prioritized.

Finally, participants discussed the need for regular evaluations of the performance of the influenza surveillance systems, which should include as a minimum an evaluation of: i) completeness ii) the system's ability to meet the surveillance objectives iii) quality and timeliness of reporting and iv) compliance with 1) case definitions 2) respiratory sample collection procedures and 3) storage and transport of respiratory samples requirements. It was stressed that evaluations, particularly of the newly established sentinel ILI and SARI surveillance, were important, especially in countries that were planning to expand sentinel surveillance. The evaluations should also contribute to achieving a better understanding of the role and importance of universal ARI and sentinel ILI systems in surveillance for influenza and other respiratory pathogens, including if and how these systems may address the objectives for early warning/event-based surveillance.

## Influenza surveillance data for public health action in NIS

Analysis and interpretation of influenza data collected in the different systems, and timely dissemination of the results to data providers and policy makers, are essential components of surveillance. The group acknowledged that a more efficient use of surveillance data was needed in order to guide appropriate prevention and control measures (including vaccination), health resource allocation and case management recommendations. Suggestions were made for improving the use of influenza surveillance data, including data collected in hospitals with SARI monitoring. Most countries collect detailed case-based data from SARI cases (e.g. data on underlying medical conditions and patient outcome), which could be used to improve understanding of risk factors associated with severe respiratory illness due to influenza, and hence guide prioritization of target-groups for seasonal influenza vaccination. Oftentimes, however, only descriptive data analyses are performed. Participants proposed that WHO/Europe organize a training course on advanced data analysis, with a focus on SARI surveillance data. Further suggestions to improve the use of surveillance data were the development of specific and realistic objectives for national influenza surveillance and to establish a mechanism for analyzing and publishing influenza surveillance data on a regular basis to provide feedback on information to data providers, central level policy makers and the public.

Many participants stressed the importance of using surveillance data for developing burden estimates for influenza for public health priority setting. However, in order to develop reliable estimates of the burden of influenza, a number of years with stable data would be required. An

assessment of which countries would possess adequate data to perform these estimates should be performed.

The impact of school closures on seasonal influenza transmission in a community and as a mitigation strategy during an influenza pandemic was debated. In general, there is limited scientific evidence of the value of this measure in NIS and it was proposed that countries review the role and effectiveness of school closures and other public health measures in influenza prevention and control.

## IV. Recommendations

Participants agreed on a number of key activities to be implemented in the short and medium term:

- Identify the roles and objectives of universal ARI and sentinel ILI systems in the surveillance of influenza and other respiratory pathogens in order to better understand if and how these systems complement each other.
- Evaluate the feasibility of performing influenza testing only as part of the sentinel surveillance to use resources most efficiently.
- Evaluate the performance of national influenza monitoring systems, including outpatient surveillance for ILI and ARI and hospital-based surveillance for SARI, and early warning systems in order to optimize surveillance and use of resources.
- Perform appropriate and timely analysis of surveillance data to inform and guide public health policies and action, and establish mechanisms for providing feedback to data providers at sentinel sites.
- Conduct refresher training for staff at sentinel ILI and SARI sites to improve quality of surveillance data and respiratory sample collection.